

WHAT IS CLAIMED IS:

- 1           1.       An isolated and purified banana DNA molecule, said DNA molecule  
2       being differentially expressed during banana fruit development.
- 1           2.       A DNA molecule according to claim 1, wherein said DNA molecule  
2       encodes a protein selected from the group consisting of a starch synthase, a  
3       granule-bound starch synthase, a chitinase, an endochitinase, a beta-1,3  
4       glucanase, a thaumatin-like protein, an ascorbate peroxidase, a metallothionein, a  
5       lectin, and another senescence-related protein.
- 1           3.       A DNA molecule according to claim 1, selected from the group  
2       consisting of clones pBAN 3-33, pBAN 3-18, pBAN 3-30, pBAN 3-24, pBAN 1-  
3       3, pBAN 3-28, pBAN 3-25, pBAN 3-6, pBAN 3-23, pBAN 3-32, and pBAN 3-46.
- 1           4.       A DNA molecule according to claim 1, wherein said DNA molecule  
2       has the nucleotide sequence selected from the group consisting of SEQ ID NO: 1,  
3       SEQ ID NO: 2, and SEQ ID NO: 3.
- 1           5.       A DNA molecule according to claim 1, wherein said DNA molecule  
2       encodes a protein having an amino acid sequence selected from the group  
3       consisting of SEQ ID NO: 4, SEQ ID NO: 5, SEQ ID NO: 6, the DNA sequence  
4       shown in Figure 16, the DNA sequence shown in Figure 17, the DNA sequence  
5       shown in Figure 18, and the DNA sequence shown in Figure 19.
- 1           6.       A chimeric gene comprising a DNA molecule which is differentially  
2       expressed during banana fruit development operably linked to a heterologous  
3       promoter.

1           14.     A protein according to claim 11, wherein said protein has an amino  
2     acid sequence selected from the group consisting of SEQ ID NO: 4, SEQ ID NO:  
3     5, SEQ ID NO: 6, the amino acid sequence shown in Figure 16, the amino acid  
4     sequence shown in Figure 17, the amino acid sequence shown in Figure 18, and  
5     the amino acid sequence shown in Figure 19.

1            23.     A plant cell transformed with a chimeric gene according to claim  
2     21.

1           24.    A plant comprising a chimeric gene according to claim 21, wherein  
2   said chimeric gene is stably integrated into the plant genome.

1           25.    A method for expression of heterologous protein in fruit comprising  
2   transforming fruiting plants with a chimeric gene according to claim 21, exposing  
3   said fruit to an plant development signal, and harvesting fruit containing said  
4   heterologous protein.

1           26.    The method of claim 25, wherein the plant development signal is  
2   ethylene gas produced by ripening fruit.

1           27.    The method of claim 25, wherein the plant development signal is  
2   exogenous ethylene gas.

1           28.    The method of claim 25, further comprising the step of isolating the  
2   heterologous proteins from the harvested fruit.

1           29.    The method of claim 25, wherein the heterologous protein is a  
2   therapeutic protein.

1           30.    A fruit produced by the method of claim 25.

1           31.    The fruit of claim 30, wherein said fruit is a banana.

1           32.    A protein produced by the method of claim 25.

1           33.    A protein produced by the method of claim 28.

1           43.     A chimeric gene according to claim 21, wherein said regulatory  
2     element has the nucleotide sequence of SEQ ID NO: 44 or is a fragment thereof.

1           44.     A chimeric gene according to claim 21, wherein said regulatory  
2     element has the nucleotide sequence of SEQ ID NO: 45 or is a fragment thereof.